

**NOTES ON THE BIOLOGY OF *BRACHYSERPHTUS BARBERI*
TOWNES (HYMENOPTERA: SERPHIDAE), A PARASITOID
OF THE FUNGUS BEETLE *MYCETOPHAGUS MELSHEIMERI*
LECONTE (COLEOPTERA: MYCETOPHAGIDAE)**

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Abstract.—In northern Florida, *Brachyserphus barberi* was observed as a solitary internal parasitoid of larvae of the fungus beetle *Mycetophagus melsheimeri*. Mature larvae of the parasitoid emerge through the intersegmental membrane of the abdomen of the host larva and pupate within about 3 days; adult emergence occurs approximately 6–7 days after pupation. A review of the distribution and biology of the parasitoid and host is provided, and beetle host records of world species of *Brachyserphus* are summarized.

This short communication provides further documentation of the parasitism of coleopterous larvae by a species of the serphid genus *Brachyserphus* (Hymenoptera: Serphidae). Herein, we give our observations on the biology of *B. barberi* Townes parasitizing larvae of the fungus beetle, *Mycetophagus melsheimeri* LeConte (Coleoptera: Mycetophagidae), a previously unreported host.

While collecting insects on the floodplain of the Apalachicola River near Bristol, Florida (in Torreya State Park) on 25 March 1986, we found numerous adults, larvae and pupae of *M. melsheimeri* in a dry, unidentified fungus under the bark and in the well-decayed wood of a felled gum tree (*Nyssa* sp.). Some of the beetle larvae were parasitized by solitary internal parasitoids of the hymenopterous family Serphidae, which were subsequently identified by ERH as *Brachyserphus barberi*. One beetle larva, still alive when collected, had a mature parasitoid larva protruding through the intersegmental membrane near the apex of the abdomen. Another beetle larva, already dead by the time of its collection, had a parasitoid pupa embedded by its caudal end in the abdomen of the host (Fig. 1). These and other live beetle larvae were kept in small rearing dishes (8 cm dia., 2 cm deep) at ambient temperature for further study and observation. On 26 March, another beetle larva appeared quiescent and distended. By that evening, a parasitoid larva had appeared through the ventral abdominal body wall of the host. These three beetle larvae and their associated parasitoids were closely monitored daily to determine parasitoid development.

Although all three of the parasitoids succumbed before adult emergence, developmental data for the last larval and pupal stages can be roughly estimated. One of the parasitoid pupae was nearly fully developed, with full adult cuticular coloration, when an elevated temperature in the rearing container induced death; the parasitoid was probably within hours of emergence. This specimen was originally collected as a mature larva, already protruding from its host. Three days later (on 28 March) pupation occurred, and on 3 April (6 days later) death ensued. In another example, a quiescent and distended beetle larva was collected on 25 March; on the following



Fig. 1. Pupa of *Brachyserphus barberi* embedded in dead host larva, *Mycetophagus melsheimeri*.

day (26 March) a parasitoid larva emerged through the abdominal wall and on 29 March (3 days later) pupation occurred.

The parasitoid genus *Brachyserphus* Hellen is a member of the Serphinae, largest of the Serphidae subfamilies, whose known hosts are mostly coleopterous larvae (Townes and Townes, 1981). The biology and host relationships of most of the eleven described species of *Brachyserphus* remain unknown. Ashmead (1893) reported the rearing of *B. abruptus* (misdet. *Exallonyx obsoletus* (Say)) from the nitidulid *Stelidota strigosa* by J. H. Comstock in 1879. Parasitism of larvae of the nitidulids *Meligethes aeneus* (F.) and *M. viridescens* (F.) by *Brachyserphus parvulus* Nees was documented by Osborne (1955), who later (1960) described and illustrated the egg, and first and last larval instars of this parasitoid. *Brachyserphus parvulus* was also reported by Morley (1922), bred from larvae of *Diphylus lunatus* F. (Erotylidae) found in the pyrenomycete fungus *Daldinia concentrica* (Bolt. ex Fr.) Ces. & de Not. (cited as *Sphaeria concentrica*) and from larvae of *Orchesia micans* Panzer (Melandryidae) in Germany. In England, Nixon (1938) bred both sexes of *B. parvulus* from bracket fungi on ash, containing *O. micans*. Pschorn-Walcher (1958, 1964) documented the same species as a parasitoid of larvae of *Triplax* sp. (Erotylidae) and *Phalacrus corruscus* (Phalacridae).

Brachyserphus barberi Townes is one of seven described species of the genus found in North America and occurs in the southeastern United States. The species description (Townes, 1981:120) was based on material from Texas, Maryland and Missouri. The holotype female was "reared from *Rhipidandrus* or *Mycetophagus* in [the polypore] *Irpex lacteus*, Anahuac, Texas, Nov. 1918, H. S. Barber." No other host records are known for this species. Our rearing it from *Mycetophagus melsheimeri* and its

collection in Florida represent a new host and a new state distribution record, respectively.

Adults and larvae of *Mycetophagus melsheimeri*, like most Mycetophagidae, probably feed exclusively on fungi, and are generally found under bark, in shelf-fungi, and on moldy vegetable refuse. This species is widely distributed in eastern North America with specimen records from Maryland, Pennsylvania, Virginia, South Carolina, Georgia, Alabama, Mississippi, Louisiana, Texas, and Iowa (Parsons, 1975).

Voucher specimens of the reared beetles and the parasitoids are in the collections of Cornell University (Ithaca, NY) and Henry K. Townes (Gainesville, FL).

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Note added in proof: On 2 May 1990, Dr. Henry Keith Townes passed away following an extended illness. His death marks the end of a career devoted to the taxonomic study of the parasitic Hymenoptera. We wish to dedicate this paper to the memory of Dr. Townes and his numerous contributions to our knowledge of the Parasitica and particularly the family Serphidae.